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Director

# Department of Pesticide Regulation



Gray Davis  
Governor

Winston H. Hickox  
Secretary, California  
Environmental  
Protection Agency

## MEMORANDUM

TO: Sue Edmiston, Senior ERS  
Worker Health and Safety Branch

**HSM-01012**

FROM: Janet Spencer, Associate ERS **[original signed by J. Spencer]**  
Worker Health and Safety Branch

DATE: October 2, 2001

SUBJECT: WH&S BRANCH ACTIVITIES AND RESULTS OF ANALYSES RELATED TO  
THE INVESTIGATION OF 43-FRE-99 (PROJECT 9903) (1)

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### Incident Chronology

On September 7, 1999, while making an aerial application of Dibrom<sup>®</sup> 8 (EPA registration number 59639-15) and Lorsban<sup>®</sup>-4E (US EPA registration number 67219-23) to cotton, an applicator drifted on a crew of 16 construction workers. Dibrom<sup>®</sup> 8 (62% active ingredient naled) was applied at the rate of one pint per acre and Lorsban<sup>®</sup>-4E (44.9% active ingredient chlorpyrifos) was applied at the rate of two pints per acre. Both pesticides are organophosphates. The tank mix also included a vegetable oil surfactant and zinc.

The men were working on a levee about 150 feet east of the cotton field, on the west side of the California Aqueduct, about 11.5 miles west of Five Points, in Fresno County. The crew attempted to move north of the application, but, as this was the same direction as the aerial applicator's pattern, they continued to be drifted upon. Between 7:15 AM and 8 AM, the drift exposure was intermittent with each pass of the airplane. Of the 16 crew members, 13 reported feeling drifted upon. The other three men reported that only the equipment they were operating was drifted on, or that they were not drifted on at all. At approximately 8 AM, the construction crew supervisor removed his crew from the levee, drove to the north side of the cotton field, and spoke with the flagger for the application, who identified the pesticides being applied.

Thirteen of the construction crew reported symptoms related to their exposure and were examined at the Hanford Community Medical Center the same morning. Symptoms included throat and eye burning and irritation, numbness in the nose, mouth and throat, sharp tingling sensations in the shoulders, disorientation, dizziness, lethargy, skin and mouth irritation, headache, shakiness, nausea, stomach ache, coughing, chest congestion and pain. These symptoms are consistent with over-exposure to organophosphate pesticides. Several workers were decontaminated by the Hanford Fire department outside the hospital before receiving treatment. Several workers went home, showered, and changed clothes prior to seeking medical treatment. Three workers reported no exposure, did not seek medical treatment, and remained asymptomatic.



### Incident Investigation

*Fresno CAC* – The Fresno CAC was informed of the incident at about 8:30 AM on September 7. An inspector arrived at the scene about 9 AM and collected one shirt worn by one of the exposed construction workers and two swabs samples from the crew's exposed heavy equipment. These samples were analyzed for residues of chlorpyrifos and naled on September 9. Results are presented in Table 1. The results confirm that drift occurred.

Table 1. Residues Found on Samples Collected for Illness Episode 43-FRE-99

Sample Type, location	Residues (µg)		Detection Limits (µg)		Analytical Lab
	chlorpyrifos	naled	chlorpyrifos	naled	
Shirt, exposed to drift	2150	760	20	20	WH&S, Sacramento
Swab, compactor	59	27	0.8	0.5	Fresno
Swab, Caterpillar	44	21	0.8	0.5	Fresno
Swab, control	None detected	None detected	0.1	0.1	

*DPR/WH&S* - On September 8, WH&S learned that all 16 workers were being sent to Job Care/Central Valley Comprehensive Care, for follow-up examinations. DPR/WH&S requested that urine samples be collected from each worker and be stored in the freezer for pick up by DPR/WH&S. Job Care collected urine samples from the workers around 3 PM. When WH&S field staff picked up the samples at 4:15 PM on September 8, the samples were stored in the freezer, but were not yet frozen. The samples were transported on dry ice on September 8 and delivered, frozen, to the CDFA, Center for Analytical Chemistry, Worker Health and Safety Laboratory, in Sacramento, on September 9. Samples were analyzed on November 2 for the presence of 3,5,6-trichloropyridinol (3,5,6-TCP), a urinary metabolite of chlorpyrifos (2). Results are presented in Table 2.

Sample results ranged from 8 – 42 ppb 3,5,6-TCP, with a mean of  $20.4 \pm 11.2$  ppb. The most recent nationwide health survey included tests for pesticide urine metabolites on 1,000 U. S. adults (3). These showed the presence of 3,5,6-TCP in 80% of those tested (n = 993). The mean level was 4.5 ppb 3,5,6-TCP, the 25<sup>th</sup> percentile was 9.5 ppb, the 75<sup>th</sup> percentile was 5.9 and the 90<sup>th</sup> percentile was 13 ppb. The maximum level observed in the national study was 77 ppb 3,5,6-TCP. The results from the exposed workers thus overlap the high end of the normal range and statistically confirm exposure to chlorpyrifos.

Table 2. Concentration (ppb) of 3,5,6-trichloropyridinol (3,5,6 TCP)<sup>1</sup> in the Urine of 16 Construction Workers Exposed to Chlorpyrifos Drift in Priority Illness Episode 43-FRE-99, with Mean and Standard Deviation (SD)

Worker ID	ppb 3,5,6-TCP
1	16
2	14
3	10
4	38
5	42
6	26
7	12
8	30
9	10
10	18
11	8
12	16
13	38
14	12
15	12
16	24
Mean	20.4
SD	11.2

1 Analytical recoveries for 3,5,6 TCP were 83 – 116%

*Violations and Fines* - Hugh's Flying Service, whose pilot conducted the aerial spraying, was found in violation of the following sections of California regulations and fined a total of \$3,000. All fines were proposed at the maximum level for the serious fine category (\$401 - \$1,000) due to the grave nature of the health hazard created when the applicator failed to use due care in making the pesticide application (4,5):

- California Code of Regulations, Title 3, Section 6614 (a)(B)(1): \$1,000 for making an application when there was a reasonable possibility of contaminating persons not involved in the application process.
- California Food and Agriculture Code, Section 12972: \$1,000 for failure to prevent substantial drift to non-target areas.
- California Food and Agriculture Code, Section 11791(b): \$1,000 for conducting a pesticide application in a faulty, careless, or negligent manner.

## References

1. Priority Illness Episode 43-FRE-99. California Department of Pesticide Regulation, Pesticide Enforcement Branch, 1001 I Street, Sacramento, California, 95814
2. California Department of Food and Agriculture, Center for Analytical Chemistry (1999) Analysis of 3,5,6-trichloropyridinol in urine. 3292 Meadowview Road, Sacramento, California 95832
3. Hill RH, Head SL, Baker S., Gregg M, Shealy DB, Bailey SL, Williams CC, and Needham LL (1995) Pesticide residues in urine of adults living in the United States: Reference Range Concentrations. Environ Res. Nov;71(2):99-108.
4. California Department of Pesticide Regulation (1998) Title 3, Division 6, California Code of Regulations. California Department of Pesticide Regulation, 1001 I Street, Sacramento, California 95814
5. California Food and Agricultural Code, Office of Administrative Law , available on their web site at: <http://www.oal.ca.gov> (accessed September 4, 2001)